An Investigation experience of a mobile tablet Application Prototypes

Dr.G.Shankar Lingam

Professor, Dept. of CSE, Chaitanya Institute of Technology & Science, Warangal, Telangana, India

E-mail: shankar@chaitanyacolleges.com

ABSTRACT: For this purpose of the study, three prototypes have been investigated, built on the basis of previous research conducted in collaboration with users. The investigation takes place with a usability testing of these three alternative prototypes of a mobile tablet application. Our study involves five navigation tasks which novices users were asked to complete with each of the three prototypes. Our results showed that participants displayed better task performance with the interface structure and layout prototype F1, which was created in collaboration with participants, in contrast to prototypes interface F2 and F3 that have been designed without the collaboration of the users, which both caused navigation problems.

KEYWORDS- Mobile devices; mobile interaction; user experience; prototyping; usability testing; human factors.

I. INTRODUCTION

With mobile technology, the way people travel have evolved in the last few years [43]. Prior to the emergence of mobile smartphones and tablets, travel browsing and booking was done, inter alia, through websites, travel agencies and magazines. Today, mobile technology has changed both how the flights are being booked and also how hotels are chosen [43].As has been noted by Hassenzahl (2002), there is no guarantee that users will actually perceive and appreciate the product in the way interface designers desire it to be perceived and appreciated. For example, a product with a specific screen layout intended to be clear and simple will not necessarily be perceived as such by novice users. Furthermore, if an interface is comprehensible within one culture, it may not be so in others. Despite the best efforts on the part of designers, new technologies often fail to meet basic human needs and desires [Norman (1999)]. The difficulties concerned in designing an interface that will deal effectively with individual preferences and experience, while minimizing frustration on the part of the user, transfer errors and learning effort, is widely recognized as a persistent problem in human-computer interaction [Benyon and Murray (1993)]. While much has been written about what makes an interface usable, the interface itself may not always be understood, in particular by those lacking a background in information technology. Making things more usable and accessible is part of the larger discipline of user-centered design (UCD), which includes a number of methods and techniques [Rubin and Chisnell (2008)]. Usability testing is a method used to evaluate a product by testing it on representative users. Greenberg and Buxton (2008) point out that "Usability evaluation is valuable for many situations, as it often helps validate both research ideas and products at varying stages in its lifecycle". The method we used to gather data in usability testing was the so-called'think aloud protocol', in which the researcher observes, while the user completes, or attempts to complete, a defined task. Prototyping is an essential part of usability testing, as it confirms whether users can effectively complete tasks by means of the prototypes that are being tested and allows us to deal with various types of problems. Furthermore, prototypes can also be useful in dealing with the more subjective aspects of an interface. A previous study by the present authors has shown that inexperienced users structure content information in a mobile tablet application differently from experienced users, when the former interact with mobile devices [Gatsou et al (2012)]. Carroll

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argues that an effective way of dealing with system complexity for the inexperienced user is to provide a functionally simple system [Carroll (1999)]. In order to create more affordable mobile interactive artifacts for inexperienced users, we have focused on the interface design of a mobile tablet application and tested it on real users. The goal of this study is to investigate the effect of different interfaces in usability testing with regard to inexperienced user performance and the perceived usability of a tablet mobile application.

Mobile applications might be utilized to facilitate good reminiscing, and as such, be used as a self soothing or perhaps distraction tool, for folks experiencing low moods or perhaps strain (Good et al, 2012). The principle is actually based upon Reminiscent Therapy (RT), designed for individuals with dementia and calls for using significant prompts, like pictures, recordings and music as an aid to recalling living functions (Norris, 1986). Some research says it's been helpful in reducing depression (Scogin F & McElreath, 1994) also as being a great tool to facilitate socialization. Positive reminiscing can certainly also market a feeling of wellbeing. The method of reminiscing as a self relaxing device is fairly under explored area. Whilst it's been predominantly utilized in individuals with dementia, there could be scope for using the concept of RT in various other mental health issues, especially where depression and overall low mood are actually standard Good et al, 2013). This could likely induce a' self soothing' process that might lend itself well to individuals who struggle with daily living as a consequence of low mood, or perhaps really that will have the occasional' off-day'. The action of' self soothing', that's calming us down, is actually in fact one of the most difficult issues to achieve when you've mental health issues. Yet the power to have the ability to cure oneself down, to basically self soothe, would be very beneficial to individuals with mental health issues, and may possibly stop troubles from escalating additional, if just by ways of a distraction. It's the premise of this investigation to create apps which will help facilitate positive reminiscing.

II.   RELATED WORKS

Think - aloud techniques have long been properly used in psychology to learn task based cognitive processes [Simon and Ericsson (1984)]. Simon and Ericsson recognize two basic types of think aloud protocols/methods, the concurrent think aloud, in which users are actually asked to verbalize the thoughts of theirs while performing the tasks, as well as the retrospective think aloud, in which users voice their ideas after finishing the job. A study by Van den Haak and De Jong (2003) thing out that the 2 methods produce types and numbers similar of problems. Carroll et al. (1987) utilized thinking aloud scientific studies to investigate how learners interacted with brand new software. Generally speaking, the strategy consists of collecting think aloud protocols in a systematic means and examining the protocols to get the users' own type of the cognitive process of theirs. The benefit of making use of the think-aloud method would be that the researcher is able to spot some usability issues that an end user may face in mingling with a prototype and can easily evaluate users' behaviour in coping with the job set them. A representative sample of the jobs to be utilized in the think aloud method is actually vital for revealing usability difficulties.

Ramey and Boren (2006) thing out that the majority of literature on the usage of think aloud in usability testing doesn't comply with the model developed by Simon and Ericsson, and that how think-aloud is really practiced by investigators deviates substantially from Erisson as well as Simon's prototype. Ramey and Boren later investigated the think aloud protocol in relation to usability studies and also learned that the methodology that Simon and Ericsson describe, though often referenced, wasn't really utilized by the practitioners. They discovered that practitioners failed to offer participants appropriate directions and in an appropriate manner. Then, having examined exactly how usability researchers carry out the thinkaloud protocol, a new

methodology for employing usability testing was developed by them. They argue that in some instances speech communication is able to provide a lot more efficient rules for obtaining the results that Simon and Ericsson were interested.

The technique has been criticized because of its limits as regards detecting just how useful the system itself is really [Hornbak and Norgaard (2006)], but the strategy continues to be a very popular and practical approach to capturing feedback and assessing the efficacy of the user interface. Obviously, it's likely that, if the end user is actually distracted by being required to speak at the exact same time as carrying out the process in question, s/he might not perform as well as s/he may otherwise. Nevertheless, in general think aloud remains a qualitative method appropriate for investigating the issues standard customers will experience in the interactions of theirs with artifacts.

III. METHODOLOGY

To examine just how novice computer users conceptualize a mobile tablet program, we developed a user test involving 3 prototypes of a mobile tablet program themed around the subject of "first aid" (Fig.1). All 3 interfaces had the exact same "look as well as feel", so as to standardize the visual appeal as well as the psychological impact made by the different alternative versions used in the test. These versions differ in terminology of conceptual designs and menu course-plotting, 1 of them, F1, having been developed on the foundation of the participant collaboration in earlier studies by the current authors [Gatsou et al (2012a)], [Gatsou et al (2012b)]. The literature gives no distinct maximum selection of participants to be used in usability testing. Nielsen (2000) argues that 5 participants will come across 80 % of the troubles in a system. At any rate, a tiny amount of users, that's, generally fewer than ten subjects, is actually sufficient for just about any formative assessment of enhancing [Petrie and Bevan (2009)]. On the many other hand, Spool as well as Schroeder (2001) state which 5 users identified only approximately 35 % of the issues in a site.

The study by Turner et al (2006) means that a team size of 7 may be great, even when the analysis is relatively complicated. In the perspective of Sauro as well as Lewis (2012) "the most crucial issue in user research, whether the data are actually qualitative or perhaps quantitative, is actually that the sample of owners you calculate belongs to the population about that you plan to make statements". Our session was designed specifically to include things like a pool representative of prospective owners of the mobile program that we had been testing. 12 participants (N=12) ranged from eighteen to 79 (mean age = 41,6, SD = 20.9, years), 7 of whom were men as well as 5 women, most of whom had participated in one or even more previous studies. All participants had been novices in terms of computing. They'd no visual or perhaps cognitive impairment and their training was of at least high school level.

To reproduce a realistic software environment, over a period of three months three prototypes were developed in Adobe Flash, which were used as a tool for recording user behaviour during interaction. Prototypes help designers to balance and resolve problems that occur in different dimensions of design. Each prototype allowed the user to interact with mobile application and to carry out various tasks.

Interface F1

The first screen of the interface consists of icons that offer easy accessibility to the topic. We settled on this layout after a participatory session with users involved in our previous study [Gatsou et al (2012b)]. There we concluded that users preferred icons for main menu selection, rather than a representation of options in words arranged hierarchically.

Fig. 1. The Interface F1

Interface F2

The colours remain the same in prototype F2, but the main menu has now been moved to the left of the screen and now employs words, instead of icons. The options are the same in number as in the prototype F1. The subcategories are now placed in the middle of the screen. The aim of this layout was to explore whether a larger amount of text helps or hinders the inexperienced user to interact with a mobile application.

Fig. 2. The Interface F2

Interface F3

Prototype F3 is identical in basic design to prototype F2, except for a horizontal bar at the top of the screen, which enables the user to select subcategories. This layout resembles that of a website. The aim of this arrangement, which simulates the web environment, was to test the familiarity of users with little experience of surfing.

Fig. 3. The Interface F3

User performance was recorded in terms of the effectiveness, efficiency and ease of use of prototypes. In order to evaluate task effectiveness, we measured the percentage of tasks successfully completed within the set time limit. Task completion time refers to the time needed to accomplish the task. To evaluate efficiency, we recorded the time needed to process a task. To measure user satisfaction, we asked users to complete a post-test questionnaire.

IV. CONCLUSION

The goal of our analysis was to look at whether an user interface layout strategy may boost functionality of jobs by new people during interaction. To get this done, we employed 3 different prototypes of the identical program. We tested our empirical methodology on 12 people, most of them novices in terminology of computer use. One of the more remarkable discoveries we made will be the great degree of difference in overall performance among the 3 distinct prototypes with regard to user strength and also the variety of errors. The usefulness and effectiveness of the F1 prototype is actually evident in the reality that owners made fewer mistakes and took a shorter time to finish their chores. Participants found that the icon selection of the F1 prototype facilitated the delivery of their activities, as did the absence of copy in menu selections. It confirms what emerged from a prior study by the current writers.

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BIOGRAPHY

Dr. G. Shankar Lingam completed his MCA in Chaitanya Degree & P.G College and M.Tech in CSE from Ramappa Engineering College respectively. He is having teaching experience of more than 20 years in various Under Graduate and Post Graduate courses. He has guided lots of students in various Under Graduate and Post Graduate Research Projects. At Present, he is working Professor, Dept. of CSE, Chaitanya Institute of Technology & Science, Warangal, Telangana, India.